RESPONSE TO REJECTION AND OBJECTION/NOTE

The Examiner set forth his definition of the term "trisoid." As to the meaning of the word "trisoid", the word "trisoid" used in the application is a geometric form that results when the sum of the distances from two points minus the distance from a third point is kept constant. The shape can vary, depending upon the constant distance that is selected. To assist in explaining this type of geometric figure, Applicant has enclosed a printout from the Mathematical Association of America's website describing this type of form dated September 2, 1996. This definition and the "trisoid" shape illustrated were in existence prior to the filing date of the application.

Applicant respectfully submits that the present invention is patentably distinguishable from the cited reference, thereby removing the basis for the 35 U.S.C. § 102(b) anticipation rejection. Several distinctions exist between the two inventions, making the instant invention patentably distinguishable from the Hung invention. In addition to the arguments set forth below, Claim 46 has been amended to make it and its dependent Claim 47 patentably distinguishable from the subject matter of the Hung patent.

The primary distinction between the two inventions is that the present invention claims distributing and filtering raw materials prior to reaching the catalyst bed, while the Hung patent discloses hydroprocessing of raw materials in the presence of a catalyzer. The two methods claimed are very different. Hydroprocessing is defined as reacting a chemical with hydrogen (or a hydrogen-containing mixture) usually in the presence of a catalyzer (p. 5, ll. 10-13). Claims 46 and 47 of the instant application deal with fluid distribution and filtering. The ceramic filter units of the instant application are used to filter and to prevent maldistribution of raw material feed streams over the catalyst to prevent channeling and bypassing portions of the catalyst bed, both of which reduce the catalyst efficiency and frequently cause pluggage in the catalyst bed. The Hung invention is a catalyzer, which is a catalyst material that once placed into a reactor vessel creates the catalyst bed. The Hung catalyzer is used to diffuse the feed throughout the entire catalyst bed in order to help speed up the reaction in the vessel. The method claims of the present invention typically use larger sized ceramics, while the Hung invention uses much smaller sized ceramics to accomplish its task. Reduced particle sizes increase catalyzer activity, as noted in the Hung patent on page 6, lines 1-2.

Smaller sized ceramics may be used in the instant invention, but the larger sized configurations are the preferred embodiment for distributing and filtering raw materials. The maximum width or length of ceramics disclosed in the Hung patent is 10 mm, which is approximately 0.3937 inches (p. 11, ll. 7-10). The present invention's size can be varied in diameter, width, or length anywhere between 1/8 (0.125) inch - three inches, as disclosed on page 6 of the application.

The Examiner states that the Hung patent discloses removing contaminants from an organic stream and providing the stream to a catalyst bed for further processing (page 21, lines 5-7). The Hung patent discloses using the catalyzer as a "protective bed"; however, the meaning of this phrase should be interpreted as providing support for the catalyst bed, as opposed to actually filtering, which is the subject matter of claim 47 of the instant invention. The ceramic filter units of the instant invention are used to filter and distribute the raw materials prior to being introduced to the catalyst bed. The materials from the Hung patent are the materials that form the catalyst bed. According to the method of Hung, if there were contaminants in the inlet raw material feed stream, there would be no filtering prior to being introduced into the catalyst bed. The raw material directly contacts the catalyzer bed upon entering the reactor vessel in the Hung patent. In the instant invention, the raw material would contact the filter media prior to being introduced to the catalyst bed. Additionally, the instant application discloses several methods for accomplishing feed stream filtering. The filtering method in claim 47 can be accomplished by installing the ceramic filter units in a plurality of configurations. Examples of the different possibilities are shown in Figures 1-3 of the application. Different sized filtering ceramic units can be placed in many different configurations depending upon the vessel configuration. Besides physically placing the filter media in different places within a reactor, the packing factor of the ceramic filter bed can be altered to cater ones filtering needs more closely (see p. 7 of the application). The application further discloses changing the packing factors in layers of ceramic filter units, which would provide filtering in stages. The ceramic filter units can be graduated from a low value (larger void volume) layer to a higher value (smaller void volume) layer as the incoming organic-based feed stream flows through the ceramic filter units (p. 11, ll. 1-6 of the application).

The same difference between the two methods of filtering exists when applied to fluid distribution. The ceramic filter units of the instant invention distribute the liquid over the catalyst

bed to prevent channeling and bypassing portions of the catalyst bed, which reduce the catalyst efficiency. According to the method in the Hung patent, the distribution of the raw material would take place all through the catalyst bed, as opposed to dispersing the liquid prior to entering the catalyst bed. The distinction here is important since the primary purpose of providing the layer of ceramic filter media is to prevent maldistribution of the raw materials prior to entering the catalyst bed. Raw material maldistribution causes many problems with catalyst beds, such as channeling, catalyst bed pluggage, decreased catalyst efficiency, etc. Preventing these types of problems is very desirable since catalyst is very expensive and can be very difficult and expensive to remove from vessels once it has become plugged. Distributing the liquid prior to reaching the catalyst bed is key to preventing these types of problems. Any liquid distribution that takes place in the Hung patent is only incidental to the primary purpose of assisting the reaction of chemicals that are difficult to react and need dispersing in order to speed up the reaction. Since the raw material hits the catalyst bed in the Hung invention without any distributing, channeling could very well still occur in the catalyst bed.

Another distinction between the two inventions is that the Hung catalyzer is very limited in the shape since the Hung patent only discloses two openings in their catalyzer (p. 7, l. 18). The two openings on the Hung ceramics are limited to either being circular or elliptical in shape (p. 9, ll. 6-7). The present invention may have a plurality of openings that vary in size, shape, and number, as shown in Figures 4, 5, 7, 8, 9, 10, 11, 12, and 13 in the application. Additionally, the cross-sectional face of the ceramic filter units also may or may not be flat, as shown in Figures 15 and 16. The Hung patent only discloses a flat cross-sectional face.

One last distinction between the two inventions is that the Hung invention is used as a catalyzer for a particular process, specifically hydroprocessing. The instant invention method claims deal with fluid distribution and filtering, both of which can be used with any organic-feed stream. The present invention can be used in a much broader range of applications, as opposed to the very limited hydroprocessing process taught by the Hung patent. There is a significant difference between being a catalyst in a hydroprocessing reaction, since the catalyst is actually assisting in the reaction, and assisting in fluid distribution and filtering. With the instant invention, there is no

chemical reaction between the ceramic filter units and the organic-feed stream. The ceramic filter units are used for mechanical purposes only, namely fluid distributing and filtering.

SUMMARY

Several substantial differences exist between the two inventions, making the presently claimed invention patentably distinguishable from the invention in the Hung patent. The methods for filtering and fluid distribution are very different, which is important to the performance of the instant invention. The shapes, sizes, and purposes of the two inventions are very different.

In commenting upon the references and in order to facilitate a better understanding of the differences that are expressed in the claims, certain details of distinction between the references and the present invention have been mentioned, even though such differences do not appear in all of the claims. It is not intended by mentioning any such unclaimed distinctions to create any implied limitations in the claims. Not all of the distinctions between the prior art and Applicant's present invention have been made by Applicant. For the foregoing reasons, Applicant reserves the right to submit additional evidence showing the distinctions between Applicant's invention to be unobvious in view of the prior art.

The foregoing remarks are intended to assist the Examiner in re-examining the application and in the course of explanation may employ shortened or more specific or variant descriptions of some of the claim language. Such descriptions are not intended to limit the scope of the claims; the actual claim language should be considered in each case. Furthermore, the remarks are not to be considered to be exhaustive of the facets of the invention which render it patentable, being only examples of certain advantageous features and differences which Applicant's attorney chooses to mention at this time.

Reconsideration of the application, as amended, and allowance of all of the claims are respectfully requested.

In view of the foregoing Amendment, Applicant respectfully submits that Claim 46 and all of the claims dependent thereon are allowable, and Applicant respectfully requests the issuance of a Notice of Allowance.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

46. (Amended) A method of fluid distribution in a chemical reactor comprising the steps of:

(a) providing a layer of ceramic filters units, at least some of the ceramic filter units having a plurality of openings extending therethrough, and at least some of the openings having a shape selected from the group consisting of ellipses and trisoids, at least some of the ceramic filter units having a plurality of flow passageways defined by the plurality of openings extending through the ceramic filter units;

(b) contacting an organic-based feed stream with the layer of ceramic filter units; and

(c) subdividing the organic-based feed stream into a plurality of smaller fluid streams by passing the organic-based feed stream through the plurality of flow passageways defined by the plurality of openings prior to the organic-based feed stream contacting a catalyst bed in the chemical reactor.

48. The method of fluid distribution of claim 47, including the step of utilizing ceramic filter units having a size of 0.5 inches to 3 inches.

49. The method of fluid distribution of claim 47, including the step of packing the ceramic filter units into the chemical reactor with a packing factor of about 200 to 500 ft^2/ft^3.

50. The method of fluid distribution of claim 47, including the step of packing the ceramic filter units in graduated layers into the chemical reactor with each layer having a different packing factor of about 200 to 500 ft^2/ft^3.

51. The method of fluid distribution of claim 47, including the step of utilizing ceramic filter units having a fluted surface.

VERSION WITH MARKINGS TO SHOW CHANGES MADE

52. The method of fluid distribution of claim 47, including the step of utilizing ceramic filter units having a polygonal cross-sectional configuration having a plurality of sides, the configuration selected from the group consisting of triangles, quadrilaterals, squares, rectangles, pentagons, hexagons, heptagons, and octagons.